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X-RAY HOLOGRAPHY WITH X-RAYS. (U)
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N00014-77-C-0543
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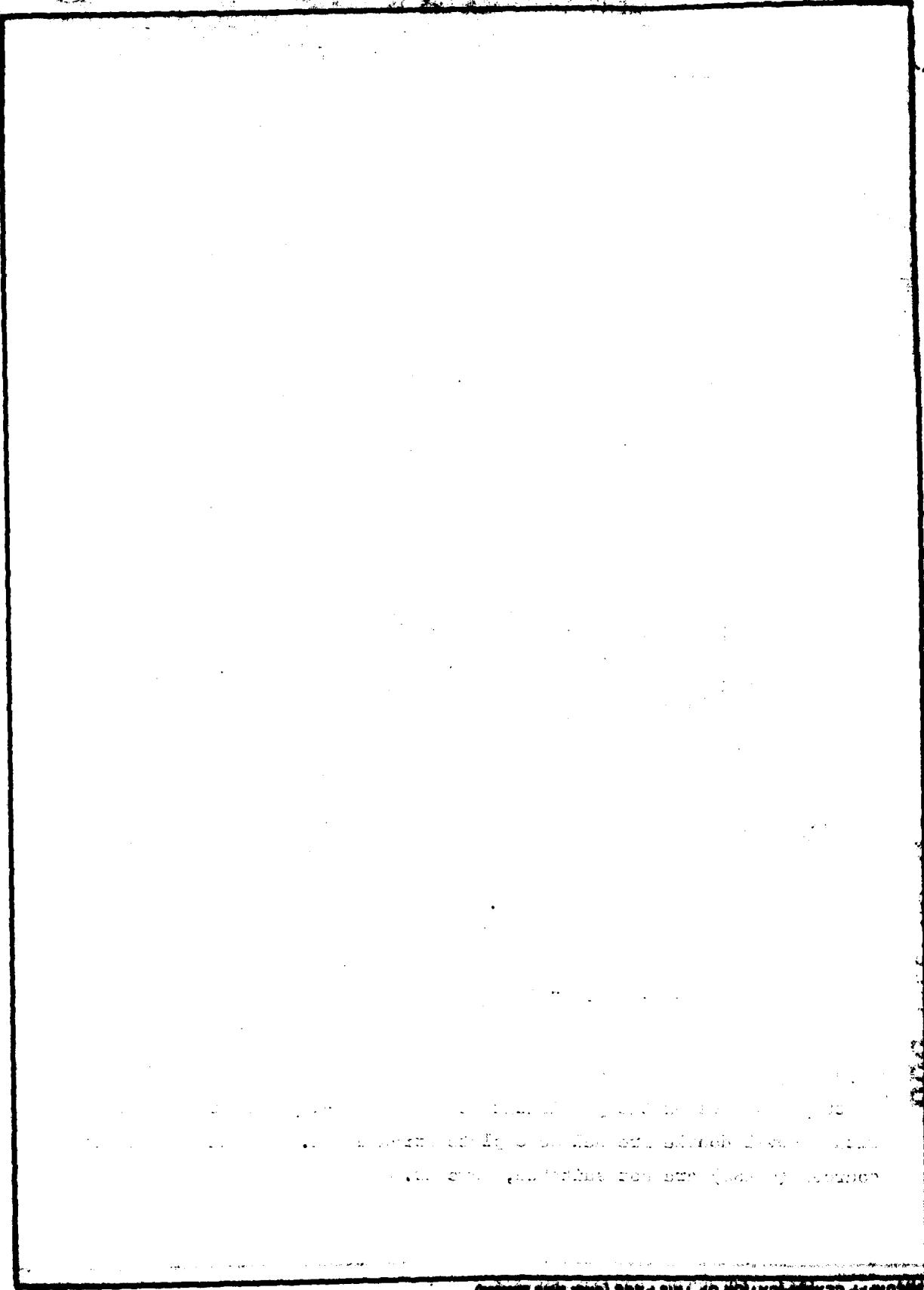
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REPORT DOCUMENTATION PAGE			LEVEL II	SC 8
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9. AUTHOR(s) Herbert Mahr	10. REPORT DATE May 1980	11. NUMBER OF PAGES 2	12. SECURITY CLASS. (of this report) Unclassified	
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17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report 18. SUPPLEMENTARY NOTES DTIC ELECTED S OCT 23 1980 D E	19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Holography, X-Rays			
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A study was made of the possibility to produce x-ray holograms near 44 Angstroms with a novel double Fresnel Zone plate arrangement. Locally available sources (CHESS) are not suitable, however.				



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(8)

Final Report

Grant # N00014-77-C-0543.

The project "X-ray Holography with X-rays" was first supported as a travel grant. A cooperative effort was planned with a group in West Germany, Drs. Niebuhr and Schmahl at the Göttingen Observatory. The Göttingen group had developed methods of producing highly accurate Fresnel zone plates for use with x-rays and we had started preliminary experiments to use Fresnel zone plates for x-ray holography. The experiments were to be performed at the DESY-Germany synchrotron facility. Because of the enormous pressure by particle physicists to build PETRA almost no time could be given to a project like ours and the cooperation coupled with visits and trips was cancelled. In the meantime the Cornell electron-positron storage ring CESR was in the discussion stages and it was decided to spend the grant money on a feasibility study of eventually using Fresnel zone plates for x-ray holography with the Cornell synchrotron facility CHESS. This work was pursued last year and during last summer with two undergraduate research helpers and myself.

First it was established that in a continuation of a previous effort x-ray holograms could be produced with a novel double Fresnel zone plate arrangement near 44\AA . The CHESS source is, however, very unsuited as a source of soft x-rays. A radically different approach would have to be used to do x-ray holography in the range of 30KeV and up for which CHESS is dedicated as a national facility. Such a proposal would go far beyond the very limited objective of this grant. It was decided then to use the knowledge and experience gained by the present grant to develop a proposal particularly suited for CHESS. This proposal is in preparation.

In summary then, Grant #N00014-77-C-0543 allowed us to positively explore the feasibility of a two-Fresnel zone plate scheme in the 40 \AA range. As efforts to collaborate for such a source failed we then turned to efforts to match the much higher energy range of the new CHESS facility at Cornell with our objective. This endeavor has just started. We felt that this was a good point at which to terminate work on Grant #N00014-77-C-0543 and to start afresh with a new proposal for future efforts.

Bibliography:

1. Benno Reuter and H. Mahr, "Experiments with Fourier Transform Holograms Using 4.48nm x-rays," J. of Physics E (1976) Vol. 9, 746.

There were no publications or theses, nor was there any capital equipment purchased on this grant.

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CORNELL UNIVERSITY
Ithaca, New York

Final Equipment Report

Date 7 April 1980

TO: Defense Contract Audit Agency - Day Hall
FROM: Purchasing Department, Room #100, Day Hall, 120 Maple Ave.
SUBJ: Contract W00014-77-C-0543; information concerning
property accountability under Appendix C, ASPR., Cornell
University Acct. No. E76-8364.

1. Work commenced on 1 July 1978.
2. Contract was physically completed on 31 March 1980.
3. Last Amendment Number A0001.
4. Value of residual material (exclusive of equipment) remaining
under contract \$ None. (If none, state "None").
 - a. Inventory list prepared Yes No
 - b. List has been submitted to the Technical Inspector on
31 March 1980.

5. Contract-Acquired Property

<u>Type</u>	<u>Amount</u>	<u>Transferred to</u>	<u>Date</u>
a. Real Property	\$ <u>-0-</u>	_____	_____
b. Plant Equipment	\$ <u>-0-</u>	_____	_____
c. Minor Equipment	\$ <u>-0-</u>	_____	_____
d. Special Tooling	\$ <u>-0-</u>	_____	_____
Total	\$ <u>-0-</u>	_____	_____

6. Government-Furnished Property

a. Real Property	\$ <u>-0-</u>	_____	_____
b. Plant Equipment	\$ <u>-0-</u>	_____	_____
c. Minor Equipment	\$ <u>-0-</u>	_____	_____
d. Special Tooling	\$ <u>-0-</u>	_____	_____
Total	\$ <u>-0-</u>	_____	_____

7. Patent and royalty certificates executed on 7 April 1980

Sponsored Programs
Copies to: Accounting
Project Director
Ofc. of Sponsored Programs

XXXXXX E.B. Girko
Gov't. Property Control Officer
Cornell University, Ithaca, N.Y.



Cornell University

Purchasing Department
120 Maple Avenue, Ithaca, New York 14850

March 31, 1980

Mr. Laurence Arra, Property Administrator
Department of the Navy
ONR-Eastern/Central Regional Office
Building 114 Section D
666 Summer Street
Boston, MA 02210

Subject: Final Inventory N00014-77-C-0543

Dear Mr. Arra:

Enclosed are four copies of the final inventory of equipment acquired under the subject contract with the Materials, Supplies and Equipment Certificate attached.

We are reporting a negative inventory.

Sincerely yours,

E.B. Pirko

(Mrs.) E.B. Pirko
Government Property
Control Officer

EBP:gc

encls: 4 w/attach.

cc: V.A. Morano, ONR-NY

Prof. H. Mahr, LASSP

Mrs. B. Keib, Sponsored Programs Acctg.

P.A. Curtiss, Office of Sponsored Programs

MATERIALS, SUPPLIES, EQUIPMENT CERTIFICATE

To: Director, Office of Naval Research, Boston Branch
666 ~~425~~ Summer Street, Boston, Massachusetts 02210

From: Cornell University
Purchasing Department
120 Maple Avenue
Ithaca, NY 18450

The undersigned, as an authorized representative of the contractor, having completed the work called for by Contract No. X00014-77-C-0543, hereby certifies that all materials, supplies, and equipment which were furnished to the contractor by the Government for use on the contract, or for which the contractor has been or will be reimbursed by the Government under the terms of the contract, if not specifically included in the attached inventory listings, were expended in performing the work called for by the contract.

Completed inventory listings attached
 No residual inventory
 All inventory accounted for under Facility Contract No. _____

E. B. Pirko
Signature (Mrs.) E. B. Pirko

Government Property Control Officer
Title

31 March 1980

Date

APPROVED: (ONR Branch Office Property Administrator)

Date: _____

INVENTORY OF GOVERNMENT OWNED CAPITAL OR MINOR EQUIPMENT ACCOUNTABLE UNDER CONTRACT NO0014-77-C-0543 U76-8364

Contractor Cornell University

Prepared by: J. B. Campbell
(Mrs.) G.P. Campbell, Assist. Govt. Property Control Officer

Primal Inventory March 31, 1980 LASSP Prof. H. Mahr

ACP - Purchased by contractor
GFE - Government furnished
CON - Constructed by contractor

Condition Code: Use a combination of letter and number (e.g. E4 or N2) except X and S use letter only. S - Salvage X - Scrap